

SEQUENCE LISTING

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<120> Ricin Vaccine and Methods of Making and Using Thereof

<130> P67452US0 (RIID 01-58)

<140>
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<170> PatentIn Ver. 2.1

<210> 1
 <211> 576
 <212> PRT
 <213> Ricinus communis

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 Asp Asn Asn Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr
 35 40 45
 Ala Gly Ala Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg
 50 55 60
 Gly Arg Leu Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu
 65 70 75 80
 Pro Asn Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu
 85 90 95
 Leu Ser Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr
 100 105 110
 Asn Ala Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe
 115 120 125
 His Pro Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr
 130 135 140
 Asp Val Gln Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg
 145 150 155 160
 Leu Glu Gln Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn
 165 170 175
 Gly Pro Leu Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Thr Gly
 180 185 190

Gly	Thr	Gln	Leu	Pro	Thr	Leu	Ala	Arg	Ser	Phe	Ile	Ile	Cys	Ile	Gln	195	200	205
Met	Ile	Ser	Glu	Ala	Ala	Arg	Phe	Gln	Tyr	Ile	Glu	Gly	Glu	Met	Arg	210	215	220
Thr	Arg	Ile	Arg	Tyr	Asn	Arg	Arg	Ser	Ala	Pro	Asp	Pro	Ser	Val	Ile	225	230	235
Thr	Leu	Glu	Asn	Ser	Trp	Gly	Arg	Leu	Ser	Thr	Ala	Ile	Gln	Glu	Ser	245	250	255
Asn	Gln	Gly	Ala	Phe	Ala	Ser	Pro	Ile	Gln	Leu	Gln	Arg	Arg	Asn	Gly	260	265	270
Ser	Lys	Phe	Ser	Val	Tyr	Asp	Val	Ser	Ile	Leu	Ile	Pro	Ile	Ile	Ala	275	280	285
Leu	Met	Val	Tyr	Arg	Cys	Ala	Pro	Pro	Pro	Ser	Ser	Gln	Phe	Ser	Leu	290	295	300
Leu	Ile	Arg	Pro	Val	Val	Pro	Asn	Phe	Asn	Ala	Asp	Val	Cys	Met	Asp	305	310	315
Pro	Glu	Pro	Ile	Val	Arg	Ile	Val	Gly	Arg	Asn	Gly	Leu	Cys	Val	Asp	325	330	335
Val	Arg	Asp	Gly	Arg	Phe	His	Asn	Gly	Asn	Ala	Ile	Gln	Leu	Trp	Pro	340	345	350
Cys	Lys	Ser	Asn	Thr	Asp	Ala	Asn	Gln	Leu	Trp	Thr	Leu	Lys	Arg	Asp	355	360	365
Asn	Thr	Ile	Arg	Ser	Asn	Gly	Lys	Cys	Leu	Thr	Thr	Tyr	Gly	Tyr	Ser	370	375	380
Pro	Gly	Val	Tyr	Val	Met	Ile	Tyr	Asp	Cys	Asn	Thr	Ala	Ala	Thr	Asp	385	390	395
Ala	Thr	Arg	Trp	Gln	Ile	Trp	Asp	Asn	Gly	Thr	Ile	Ile	Asn	Pro	Arg	405	410	415
Ser	Ser	Leu	Val	Leu	Ala	Ala	Thr	Ser	Gly	Asn	Ser	Gly	Thr	Thr	Leu	420	425	430
Thr	Val	Gln	Thr	Asn	Ile	Tyr	Ala	Val	Ser	Gln	Gly	Trp	Leu	Pro	Thr	435	440	445
Asn	Asn	Thr	Gln	Pro	Phe	Val	Thr	Thr	Ile	Val	Gly	Leu	Tyr	Gly	Leu	450	455	460
Cys	Leu	Gln	Ala	Asn	Ser	Gly	Gln	Val	Trp	Ile	Glu	Asp	Cys	Ser	Ser	465	470	475
Glu	Lys	Ala	Glu	Gln	Gln	Trp	Ala	Leu	Tyr	Ala	Asp	Gly	Ser	Ile	Arg	485	490	495
Pro	Gln	Gln	Asn	Arg	Asp	Asn	Cys	Leu	Thr	Ser	Asp	Ser	Asn	Ile	Arg	500	505	510
Glu	Thr	Val	Val	Lys	Ile	Leu	Ser	Cys	Gly	Pro	Ala	Ser	Ser	Gly	Gln			

515	520	525
Arg Trp Met Phe Lys Asn Asp Gly Thr Ile Leu Asn Leu Tyr Ser Gly		
530	535	540
Leu Val Leu Asp Val Arg Ala Ser Asp Pro Ser Leu Lys Gln Ile Ile		
545	550	555 560
Leu Tyr Pro Leu His Gly Asp Pro Asn Gln Ile Trp Leu Pro Leu Phe		
	565	570 575

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 <213> Ricinus communis

<400> 2

Met Lys Pro Gly Gly Asn Thr Ile Val Ile Trp Met Tyr Ala Val Ala		
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Thr Trp Leu Cys Phe Gly Ser Thr Ser Gly Trp Ser Phe Thr Leu Glu		
	20	25 30
Asp Asn Asn Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr		
	35	40 45
Ala Gly Ala Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg		
	50	55 60
Gly Arg Leu Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu		
65	70	75 80
Pro Asn Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu		
	85	90 95
Leu Ser Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr		
	100	105 110
Asn Ala Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe		
	115	120 125
His Pro Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr		
	130	135 140
Asp Val Gln Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg		
145	150	155 160
Leu Glu Gln Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn		
	165	170 175
Gly Pro Leu		

<210> 3
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<213> Ricinus communis

<400> 3

Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly Ala
1 5 10 15
Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg Leu
20 25 30
Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu Pro Asn Arg
35 40 45
Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu Leu Ser Asn
50 55 60
His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr Asn Ala Tyr
65 70 75 80
Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe His Pro Asp
85 90 95
Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr Asp Val Gln
100 105 110
Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg Leu Glu Gln
115 120 125
Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn Gly Pro Leu
130 135 140
Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Thr Gly Gly Thr Gln
145 150 155 160
Leu Pro Thr Leu Ala Arg Ser Phe Ile Ile Cys Ile Gln Met Ile Ser
165 170 175
Glu Ala Ala Arg Phe Gln Tyr Ile Glu Gly Glu Met Arg Thr Arg Ile
180 185 190
Arg Tyr Asn Arg Arg Ser
195

<210> 4

<211> 188

<212> PRT

<213> Ricinus communis

<400> 4

Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly Ala
1 5 10 15
Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg Leu
20 25 30
Thr Val Leu Pro Asn Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile
35 40 45
Leu Val Glu Leu Ser Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu
50 55 60

Asp Val Thr Asn Ala Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser Ala
 65 70 75 80
 Tyr Phe Phe His Pro Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr His
 85 90 95
 Leu Phe Thr Asp Val Gln Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn
 100 105 110
 Tyr Asp Arg Leu Glu Gln Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu
 115 120 125
 Leu Gly Asn Gly Pro Leu Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr
 130 135 140
 Ser Thr Gly Gly Thr Gln Leu Pro Thr Leu Ala Arg Ser Phe Ile Ile
 145 150 155 160
 Cys Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Gln Tyr Ile Glu Gly
 165 170 175
 Glu Met Arg Thr Arg Ile Arg Tyr Asn Arg Arg Ser
 180 185

<210> 5
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 <213> Ricinus communis

<400> 5
 Met Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly
 1 5 10 15
 Ala Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg
 20 25 30
 Leu Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu Pro Asn
 35 40 45
 Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu Leu Ser
 50 55 60
 Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr Asn Ala
 65 70 75 80
 Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe His Pro
 85 90 95
 Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr Asp Val
 100 105 110
 Gln Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg Leu Glu
 115 120 125
 Gln Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn Gly Pro
 130 135 140
 Leu Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Thr Gly Gly Thr
 145 150 155 160

Gln Leu Pro Thr Leu Ala Arg Ser Phe Ile Ile Cys Ile Gln Met Ile
165 170 175

Ser Glu Ala Ala Arg Phe Gln Tyr Ile Glu Gly Glu Met Arg Thr Arg
180 185 190

Ile Arg Tyr Asn Arg Arg Ser
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<210> 6

<211> 189

<212> PRT

<213> Ricinus communis

<400> 6

Met Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly
1 5 10 15

Ala Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg
20 25 30

Leu Thr Val Leu Pro Asn Arg Val Gly Leu Pro Ile Asn Gln Arg Phe
35 40 45

Ile Leu Val Glu Leu Ser Asn His Ala Glu Leu Ser Val Thr Leu Ala
50 55 60

Leu Asp Val Thr Asn Ala Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser
65 70 75 80

Ala Tyr Phe Phe His Pro Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr
85 90 95

His Leu Phe Thr Asp Val Gln Asn Arg Tyr Thr Phe Ala Phe Gly Gly
100 105 110

Asn Tyr Asp Arg Leu Glu Gln Leu Ala Gly Asn Leu Arg Glu Asn Ile
115 120 125

Glu Leu Gly Asn Gly Pro Leu Glu Glu Ala Ile Ser Ala Leu Tyr Tyr
130 135 140

Tyr Ser Thr Gly Gly Thr Gln Leu Pro Thr Leu Ala Arg Ser Phe Ile
145 150 155 160

Ile Cys Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Gln Tyr Ile Glu
165 170 175

Gly Glu Met Arg Thr Arg Ile Arg Tyr Asn Arg Arg Ser
180 185

<210> 7

<211> 198

<212> PRT

<213> Ricinus communis

<400> 7

Met Val Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly Ala

1	5	10	15
Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg Leu	20	25	30
Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu Pro Asn Arg	35	40	45
Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu Leu Ser Asn	50	55	60
His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr Asn Ala Tyr	65	70	75
Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe His Pro Asp	85	90	95
Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr Asp Val Gln	100	105	110
Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg Leu Glu Gln	115	120	125
Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn Gly Pro Leu	130	135	140
Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Thr Gly Gly Thr Gln	145	150	155
Leu Pro Thr Leu Ala Arg Ser Phe Ile Ile Cys Ile Gln Met Ile Ser	165	170	175
Glu Ala Ala Arg Phe Gln Tyr Ile Glu Gly Glu Met Arg Thr Arg Ile	180	185	190
Arg Tyr Asn Arg Arg Ser	195		

<210> 8
 <211> 188
 <212> PRT
 <213> Ricinus communis

1	5	10	15
Met Val Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly Ala			
Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg Leu	20	25	30
Thr Val Leu Pro Asn Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile	35	40	45
Leu Val Glu Leu Ser Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu	50	55	60
Asp Val Thr Asn Ala Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser Ala	65	70	75
Tyr Phe Phe His Pro Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr His			

				85						90					95
Leu	Phe	Thr	Asp	Val	Gln	Asn	Arg	Tyr	Thr	Phe	Ala	Phe	Gly	Gly	Asn
			100					105					110		
Tyr	Asp	Arg	Leu	Glu	Gln	Leu	Ala	Gly	Asn	Leu	Arg	Glu	Asn	Ile	Glu
		115					120					125			
Leu	Gly	Asn	Gly	Pro	Leu	Glu	Glu	Ala	Ile	Ser	Ala	Leu	Tyr	Tyr	Tyr
	130					135					140				
Ser	Thr	Gly	Gly	Thr	Gln	Leu	Pro	Thr	Leu	Ala	Arg	Ser	Phe	Ile	Ile
145					150					155					160
Cys	Ile	Gln	Met	Ile	Ser	Glu	Ala	Ala	Arg	Phe	Gln	Tyr	Ile	Glu	Gly
				165					170					175	
Glu	Met	Arg	Thr	Arg	Ile	Arg	Tyr	Asn	Arg	Arg	Ser				
			180					185							

<210> 9
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 <212> PRT
 <213> Ricinus communis

<400> 9

Ile	Phe	Pro	Lys	Gln	Tyr	Pro	Ile	Ile	Asn	Phe	Thr	Thr	Ala	Gly	Ala
1				5					10					15	
Thr	Val	Gln	Ser	Tyr	Thr	Asn	Phe	Ile	Arg	Ala	Val	Arg	Gly	Arg	Leu
			20					25					30		
Thr	Asn	Arg	Val	Gly	Leu	Pro	Ile	Asn	Gln	Arg	Phe	Ile	Leu	Val	Glu
		35					40					45			
Leu	Ser	Asn	His	Ala	Glu	Leu	Ser	Val	Thr	Leu	Ala	Leu	Asp	Val	Thr
	50					55					60				
Asn	Ala	Tyr	Val	Val	Gly	Tyr	Arg	Ala	Gly	Asn	Ser	Ala	Tyr	Phe	Phe
65					70					75					80
His	Pro	Asp	Asn	Gln	Glu	Asp	Ala	Glu	Ala	Ile	Thr	His	Leu	Phe	Thr
				85					90						95
Asp	Val	Gln	Asn	Arg	Tyr	Thr	Phe	Ala	Phe	Gly	Gly	Asn	Tyr	Asp	Arg
			100					105					110		
Leu	Glu	Gln	Leu	Ala	Gly	Asn	Leu	Arg	Glu	Asn	Ile	Glu	Leu	Gly	Asn
		115					120					125			
Gly	Pro	Leu	Glu	Glu	Ala	Ile	Ser	Ala	Leu	Tyr	Tyr	Tyr	Ser	Thr	Gly
	130					135					140				
Gly	Thr	Gln	Leu	Pro	Thr	Leu	Ala	Arg	Ser	Phe	Ile	Ile	Cys	Ile	Gln
145					150					155					160
Met	Ile	Ser	Glu	Ala	Ala	Arg	Phe	Gln	Tyr	Ile	Glu	Gly	Glu	Met	Arg
				165					170					175	
Thr	Arg	Ile	Arg	Tyr	Asn	Arg	Arg	Ser							

180

185

<210> 10
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 <212> PRT
 <213> Ricinus communis

<400> 10
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 Ala Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg
 20 25 30
 Leu Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu Pro Asn
 35 40 45
 Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu Leu Ser
 50 55 60
 Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr Asn Ala
 65 70 75 80
 Tyr Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe His Pro
 85 90 95
 Asp Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr Asp Val
 100 105 110
 Gln Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg Leu Glu
 115 120 125
 Gln Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn Gly Pro
 130 135 140
 Leu Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Thr Gly Gly Thr
 145 150 155 160
 Gln Leu Pro Thr Leu Ala Arg Ser Phe Ile Ile Cys Ile Gln Met Ile
 165 170 175
 Ser Glu Ala Ala Arg Phe Gln Tyr Ile Glu Gly Glu Met Arg Thr Arg
 180 185 190
 Ile Arg Tyr Asn Arg Arg Ser Ala
 195 200

<210> 11
 <211> 190
 <212> PRT
 <213> Ricinus communis

<400> 11
 Met Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly
 1 5 10 15
 Ala Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg
 20 25 30

<400> 14
ctgtcagagg tagattgact gtcttgccta acagagttgg 40

<210> 15
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Antisense PCR
oligonucleotide sequence

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